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ABSTRACT

The program of the Syracuse University Children's Center for the design and maintenance of an optimal living and learning environment for infants from 6 to 36 months from low-income families is presented. A checklist, Assessing the Behaviors of Caregivers (ABC) was designed to gather evidence for the extent to which teaching staff actually provided the inputs which had been articulated as specific goals of the "Infant-Fold." The checklist contains 40 items divided into seven categories. Ss were five caregivers working in the "Infant-Fold" during observation. The ABC scale is administered by an observer who tallies the behaviors of the Ss during several two-minute rating periods. As a formative evaluation technique, ABC is recommended for widespread use to monitor the quality of day care and educational programs for infants and to improve the quality of that input on a continuing basis. (CK)

Assessing Teacher Behaviors with Infants in Day Care

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Although a variety of research tools exist to assess teacher and teacher-learner interactions in classrooms for older children (Baird, 1971; Coller, 1972; Ober, Bentley, & Miller, 1971; Withall, 1960), and some instruments have been designed for the preschool environment, (Stern, 1967; Wilensky, 1968), few data exist to link specific teacher behaviors to the success of preschool intervention programs. Characterization of a child care program is often made by detailed description of stated goals and objectives rather than by specification of actual content, style, and quality of program. The possible misconceptions inherent in thus characterizing a program have been discussed in detail by Katz (1969).

Evaluation of intervention programs often focuses on the child in order to assess program success or validity of the conceptual model within which a program operates. However, as Sigel (1969, Seminar #6) has observed, the "success of the intervention programs is ultimately dependent on teachers' acceptance, commitment, and skill in carrying out programs (p. 1)." Teacher involvement with young children is intimately related to curricular success, but few day care or preschool service programs have had the resources to undertake development of or application of systematic or elaborate evaluation techniques with teachers. Evaluation of infant and preschool teacher styles and inputs has been carried out in classroom and child care settings (Beller, 1970; Connors & Eisenberg, 1966; Honig, Caldwell, & Tannenbaum, 1970; Medley, Quirk, Schluck, & Ames, 1971; Meyer & Lindstrom, 1969; and Ricciuti, 1970) and such studies have underscored the feasibility and importance of attempts to conceptualize and classify teacher inputs as a first step in relating these inputs to child outcomes.

Such relationships may indicate that modifications of teacher behaviors need to be undertaken. The effectiveness of increased training in changing such teacher characteristics as kind of discipline, amount of warmth, and frequency of verbalizations offered to children has been demonstrated in several programs (Holmberg, Thomson, & Baer, 1972; Prescott & Jones, 1967).

[1] Paper presented at the meeting of the American Educational Research Association,

The recent expansion of day care services for infants particularly heightens the importance of devising economical and accurate techniques to assess caregiving environments for the very young. Infant development has been found particularly vulnerable to provision or deprivation of a special nurturant relationship with caregivers (Ainsworth, 1967; Bowlby, 1952; Provence & Lipton, 1961; Yarrow, 1972).

The Syracuse University Children's Center has been engaged for almost a decade in the design and maintenance of an optimal living and learning environment for infants from 6 to 36 months from low-income families. The program is predicated on Eriksonian, Piagetian, and language development principles, and serves the infants' nutritional and physical needs as well. The "Infant-Fold," with a child-caregiver ratio of 4 to 1, offers highly individualized care during either morning or afternoon for babies under 15 months, well within Piaget's sensorimotor period. This youngest infant group was the first focus of our efforts to create an evaluation instrument to assess caregiver inputs. A checklist, Assessing the Behaviors of Caregivers (ABC), was designed to gather evidence for the extent to which teaching staff actually provided the inputs which had been articulated as specific goals of the "Infant-Fold."

In developing the ABC checklist certain pragmatic objectives were defined:

Breadth. The instrument should cover those broad categories of caregiver input which are both congruent and incongruent with program principles and goals, so that a realistic and representative range of caregiver behaviors is sampled.

Brevity. A one-page sheet on a legal-paper size clipboard should suffice to record all caregiver items to be observed and tallied during each half-hour observation of a teacher.

Accuracy. High interobserver reliability should be quickly attained.

Economy. ABC categories should refer to operationally defined caregiver behaviors which could easily be learned and applied in classroom observations. The resultant summed behavior frequencies should be easily comparable to data taken in other settings or focused on other teachers. Highly specialized evaluators should not be necessary. Low-budget day care services should be able to afford such a monitoring system.

Sensitivity of the instrument. Frequency counts of teacher input should reflect individual teacher variation in the efficacy with which program goals are being implemented. Such sensitivity permits specification of areas where teacher inputs need to be augmented or decreased.

The checklist tallies should be able to reflect in-service training procedures, designed to change the frequency of specified teacher behaviors (for example, to increase teacher provision of Piagetian means-ends games to infants).

Specification of each individual infant with whom a teacher interacts. Input variability due to child characteristics such as sex may thus be examined and discussed with teaching staff in the light of program goals of equality of quality care for all infants.

Description of the Instrument

The ABC checklist consists of 40 items clustered in seven categories which reflect the objectives of the Children's Center "Infant-Fold" program. A complete list of checklist items may be found in Table 1. The seven behavioral areas of inquiry are:

1. Facilitation of early language in infants.
2. Positive social-emotional behaviors toward and with infants.
3. Adult negative social-emotional behaviors with infants. (Hopefully frequencies in this category will be found to be minimal.)
4. Presentation of Piagetian games and opportunities for sensori-motor learning.
5. Provision of caregiving routines (such as feeding and diapering) to infants.
6. Performance of necessary housekeeping tasks.
7. Provision of motoric and kinesthetic experiences for infants.

An eighth category "Does nothing" has been included in the checklist.

Interobserver reliabilities have been determined by obtaining a percentage agreement between two observers on the total number of tallies obtained within each category during each 30-minute observation period. The mean percentage agreement between two observers for 10 half-hours of observation ranges from 50% (for the physical development category) to near 100% (for the positive socio-emotional category). The mean percentage agreement for all seven categories is 77%.

Subjects

The subjects were five female caregivers assigned either to full- or part-time work in the "Infant-Fold" during the period of observation. Two of the five caregivers were highly trained with at least three years of experience as teachers of young infants. The observer (Ms. Williamina Wollin) who collected the majority of the data, was unaware of the status of teachers as far as their prior expertise or training was concerned.

Data Collection Procedure

The ABC scale is administered by stationing an observer in the classroom. The observer tallies the first clear example of ABC scale behaviors which a caregiver emits during a two-minute rating period. The scale permits specification of the particular infant for or with whom any behaviors occur. This tally is repeated for three more two-minute periods. The observer rests for two minutes, then rates again for four more two-minute periods. This ten-minute cycle is repeated three times in a half-hour session for a caregiver, allowing for a maximum of 12 tallies of each individual behavior every half hour. Then the observer switches to another caregiver and rates two-minute samples of behavior in the same fashion for another half-hour session.

Seventy half-hours of data were collected systematically from 9:00 A. M. to 12:00 noon, and from 1:00 P. M. to 4:00 P. M. across all five days of the week. This data collection design ensures that the frequencies of teacher input recorded are not restricted to optimal inputs which do occur at peak loving and teaching times. These data, rather, represent a sampling of caregiver inputs during the entire extent of a day care day, including those times when teacher chores, such as washing out bibs, preclude the simultaneous delivery of, for example, hugs or diapering.

Results and Discussion

Table 1 shows the percentage of caregiver behaviors recorded for the 33 items which comprised the initial ABC checklist. Subsequent to this study and based on the observations recorded for the study, additional items were added to ABC as indicated on Table 1. The percentage used is based on the total number of

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Insert Table 1 about here

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behaviors tallied for each item out of the 12 tallies theoretically possible during each half-hour of the 70 observation periods. Thus there were 840 possible tallies for each item. Fewer tallies exist for later added items.

A gratifying finding from Table 1 is that while positive emotional adult behaviors with infants, such as smiling and using loving tones, frequently occurred, negative emotional behaviors seldom occurred. Alerting the infants or increasing their attention span through direct eye contact occurred in about one-half of the time periods. Pats, hugs, and kisses were given in about 15% of the sampled periods.

Physical punishment was never administered. "No-no" and other verbal and physical restraints occurred in about 10% of the sampled periods. Use of time-out or isolation as behavior modification techniques occurred in less than 1% of the time periods.

For this age group of infants, facilitation of sensorimotor development has been given particular curricular emphasis. The data indicate that games and opportunities for infants to learn causal relations, or object permanence were presented in about one-quarter of the time periods sampled. However, presentation of special opportunities to learn spatial relationships were infrequently presented. One such task involves setting up special furniture arrangements. This is done to encourage a baby to try out ways of getting to a desirable toy which has been rolled under furniture or perhaps visibly placed out of reach. Low teacher tallies for this item possibly reflect the effort and time such furniture arrangements can require of a constantly busy infant caregiver.

Another important curricular emphasis is language facilitation. Teachers are trained in techniques of eliciting and responding to infant vocalizations. Caregivers are to label objects, qualities, actions, and people for the infants in their care. Positive expressions of praise are taught as preferred techniques to encourage and shape more mature behaviors in babies. The data show that verbal encouragements were offered and, additionally, vocalizations were actively elicited, in about one-third of the periods sampled. Just talking to babies occurred even more frequently. In almost 70% of the periods sampled some kind of adult chatter or sociable comments were emitted to babies.

Reading to infants, which is supposed to be part of the daily language program, was found, on the contrary, to occur disappointingly rarely--in 2% of possible tallies.

Caregiving routines, as might be expected in a setting where young babies are well cared for, occupied a good deal of teacher time. Feeding occurred in about 20% of periods sampled. Diapering and cleaning babies each occurred in about 10% of the periods. Tidying and cleaning in the "Infant-Fold" room occurred in about one-third of the sampled periods.

Table 1 indicates too that "teacher does nothing" occurred in far less than 1% of the sessions.

Teacher behaviors in the major input categories were also analyzed as a function of time of day, whether during the morning or afternoon session, and as a function of time during the week. Three time points in a week were used: Monday--immediately after the children have been away from the Center for the weekend; the average of three midweek days; and Friday when the Center premises must be cleared to conform to the requirements of the church in which the program is housed.

From Table 2 it can be seen that neither time of day nor time of week seemed to affect in any important ways the distribution of teacher inputs. There is a

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Insert Table 2 about here

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very slight trend for emotional inputs--both positive and negative--to increase as the week wears on. The inputs delivered seem to follow very much the same pattern whether infants attended the morning or afternoon Infant-Fold program. However, room chores were carried out somewhat more frequently in the afternoons. Sensorimotor tasks and opportunities for babies were slightly more often presented during morning sessions.

The ability of caregivers who are on the job all day to provide essentially the same levels of language and positive emotional stimulation to infants regardless of time of day is an important finding. The design of day care experiences for infants must be predicated on a uniformly high quality of adult-infant interactions to be expected regardless of the length of time the infant or the teacher spends in the day care setting.

Another analysis which should be of critical interest to day-care planners involved the determination of the efficiency of program inputs to children when infant attendance was at a high level. One of the Center training program efforts

has been specifically directed to teaching caregivers how to cope with delivering language, cognitive and socio-emotional positive input when they have several infants in their care. The data indicate this goal has been achieved. Essentially no difference in behavioral inputs from the caregivers was found whether two, three, or the full complement of four babies were in attendance at the Center. Such data certainly does not suggest rejection of a day-care model because of the economic unfeasibility possibly inherent in a one-to-one or two-to-one child care ratio. Nor of course do these data suggest in any way that a less favorable child to adult ratio would still provide desirable teacher levels of affectional, cognitive, and physical caregiving to babies.

An initial objective of this study was to determine whether a brief inventory such as ABC would be able to differentiate adequately among teachers. Such sensitivity permits feedback of the sort the Center Director was able to give to "Infant-Fold" teachers when the low frequencies of reading to babies were tabulated as noted earlier.

Table 3 summarizes the mean percentages of teacher inputs in each checklist category. The caregivers indeed varied among themselves in the proportion of

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Insert Table 3 about here

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program inputs offered to infants. Two of the five caregivers provided twice as much motoric experience for infants as did the others. More opportunities for sensorimotor learning were provided by the two most experienced teachers (A and B). The three caregivers who carried out the most language facilitation also provided more Piagetian games for infants during the observation periods.

Table 3 also shows that teacher C carried out child care routines, such as diapering, three times as frequently as teacher B. Such data suggest that

the ABC checklist can be useful in alerting supervisory personnel to potential imbalances in the burden of work assumed by a particular co-worker in an infant care facility. Of course, such data may also be interpreted as indicating that a particularly comfortable working relationship exists among co-caregivers, so that each takes care of program areas in accordance with personal preferences accepted by the other.

A more detailed analysis of teacher differences was carried out for certain of the categories. Table 4 indicates individual teacher differences in the variety of language stimulation offered to infants.

Insert Table 4 about here

All teachers carried on a great deal of sociable chatter with babies. But teacher C did so on the average during 6 out of every 12 two-minute observation periods and teacher E chatted sociably on the average, during 9 of the 12 two-minute observation periods.

Teacher C gave 3 times as few encouraging remarks and three times as few informational remarks to her infants as did teacher B. Teacher A sang or chanted to her infants far more frequently than the other four caregivers. Table 4 does indicate that in other language areas, however, such as prompting babies to vocalize through elicitation or through contingent responses to vocalization, all five teachers were fairly alike in the amount of such stimulation they offered.

Significant relations have been found for infants as young as five months between mothers' naturally occurring contingent responses to infant vocalizations and amount of infant vocalizing to a test toy (Yarrow, Rubenstein, Pederson, & Jankowski, 1972). This evidence of caregiver effect on infants' language behaviors at such young ages gives further importance to the ability of a caregiver assessment instrument to monitor such inputs to infants.

Teacher variability will often prompt supervisory personnel to introduce training sessions or workshops to alert and re-orient staff to the infant classroom and project goals which teachers may be forgetting to implement. Additionally, such training may need to focus on actual skills, games, and tasks which will increase teacher repertoire in line with program expectations.

Such a training procedure was carried out during the data collection period of the present study. All five "Infant-Fold" teachers had undergone varying degrees of prior training, particularly with respect to the importance of language and positive emotional inputs to infants. Experiences with Piagetian tasks and with methods to facilitate sensorimotor development were, however, fairly new to teachers C, D, and E. Figure 1 indicates the differential effectiveness produced by workshops, lectures, and demonstrations on language development and on Piagetian development and games. All five teachers provided much the same

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Insert Figure 1 about here

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pattern of language facilitation prior to and after training. Indeed, frequencies of language facilitation were quite similar for all teachers except teacher E, whose initial language scores were exceptionally high.

Figure 1 suggests that training did increase the provision of Piagetian sensorimotor games to babies. Even teachers A and B, who had been previously intensively trained to provide such experiences, increased their Piagetian inputs after the training program.

It is of particular interest to examine teacher E's Piagetian inputs for each of six categories, (object permanence, means-ends, imitation, causality, prehension and space) pre and post training. Teacher E had recently come to work in the "Infant-Fold" after many years of experience as a teacher in the open education settings the Children's Center provides for older infants. She therefore was very proficient in teaching preoperational and language skills, but not sensorimotor skills. Figure 2 shows the large increase in sensorimotor inputs in all six Piagetian areas provided by teacher E after training. Figure 2

Insert Figure 2 about here

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demonstrates that the ABC checklist was able to differentiate specific teacher

areas of competence, identify areas where skill-building was necessary, and confirm the effectiveness of the training program provided to increase competencies.

Conclusions

Day care program evaluation experts have strongly urged that child output measures alone, particularly when they consist only of I.Q. scores or other narrowly cognitive measures, do not properly reflect program efficacy.

The development of measures which reflect caregiving and learning environments are of great importance in order to ensure the quality of experience provided for young infants.

Most infant day care environments do not have the personnel or economic resources to provide elaborate evaluation of adult-infant interactions or to apply sophisticated and lengthy measurement instruments to their operation. The ABC checklist reported here has demonstrated its utility and practicality as an infancy-teacher assessment instrument by being easily learned, reliably applied, and directly relevant to infant care goals and practices. ABC has proved sensitive to differences in frequency of delivery of a variety of teacher behaviors, both on a broad categorical level and with respect to specific competencies. Further, ABC has provided assessment of the effectiveness of intensive preservice training for personnel when such personnel were observed systematically prior to and after such training. Thus, as a formative evaluation technique ABC can be recommended for widespread use to monitor the quality of day care and educational programs for infants and to improve the quality of that input on a continuing basis.

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TABLE 1
Percentage of Caregiver Behaviors Recorded for Five Teachers of Infants During 840 Two-Minute Observations

Items	% Tallied
I. Language Facilitation	
1. Elicits vocalization (through initiation and contingent responses)	36.7
2. Converses; chats to infant	69.9
3. Praises or encourages child	
4. Offers help or solicitous remarks	23.5
5. Inquires of child; requests	19.2
6. Gives explanation, information, or culture rules	25.7
7. Labels sensory experiences	2.9
8. Reads to or shows pictures	2.0
9. Sings to or plays music for	14.4
II. Social-Emotional Positive Inputs	
1. Smiles at child	63.3
2. Uses loving or reassuring tones	63.7
3. Provides physical loving contact	14.4
4. Plays social games with child	5.5
5. Uses eye contact to arouse, orient, or sustain infant's attention	52.4
III. Social-Emotional Negative Inputs	
*1. Criticizes verbally; scolds;	0.0**
*2. Forbids; negative mands	9.1**
*3. Acts angry; is physically impatient; frowns; restrains child physically	.1**
Total of 1, 2, & 3	10.7
4. Punishes physically	0.0
5. Isolates child (as behavior modification technique for unacceptable behaviors)	0.2
6. Ignores child when child shows need for attention	0.7

Items	% Tallied
IV. Presentation of Piagetian Tasks and Opportunities for Sensorimotor Development	
1. Object Permanence	24.3
2. Means and Ends	26.8
3. Imitation	30.7
4. Causality	29.4
5. Prehension	24.5
6. Space	7.9
*7. New schemas	8.3**
V. Caregiving Routines: with child	
1. Feeds	18.2
2. Diapers; Toilets	11.1
3. Dresses; Undresses	7.4
4. Washes; Cleans	12.9
*5. Prepares child for sleep	5.2**
*6. Physical shepherding	7.5**
*7. Eye-checks on child's well-being	78.3**
VI. Caregiving Routines: with environment	
1. Prepares food	5.5
2. Tidies room or environment	34.4
*3. Helps other caregivers	5.6**
VII. Physical Development	
1. Provides kinesthetic stimulation	33.9
2. Provides large-muscle play	15.4
VIII. Does Nothing	0.2

* All starred items have been added to the ABC (Assessing Behaviors of Caregivers) checklist subsequent to this study or were initially combined, as indicated, with other items.

** Percentages are based on 120 2-minute observations of teachers A and B only.

TABLE 2

Percentage of Caregiver Behaviors Occurring in Each Input Category of the ABC Checklist as a Function of Time of Day and of Week

Program Category	Total Percentages for an Average Day	Time of Day		Time of Week		
		A.M. N=40	P.M. N=30	Monday N=11	Mid-week N=40	Friday N=19
anguage acilitation	32.0	31.0	33.3	31.4	33.8	28.8
ositive Emotional nput	27.2	27.9	26.3	24.9	26.8	29.1
egative Emotional nput	1.6	1.6	1.6	1.0	1.4	2.2
iagetian asks	19.6	20.5	18.4	22.2	17.9	21.2
aregiving outines: Infant	6.8	7.4	6.0	6.2	7.0	6.7
aregiving outines: nvironment	5.7	5.2	6.4	4.8	5.9	5.8
lotor Input	6.7	6.3	7.8	9.1	6.8	5.6
o Nothing	0.0	0.0	0.0	0.0	0.0	0.0

TABLE 4

Percentage of Total Possible Behaviors
Occurring in Eight Program Categories for Each of Five Caregivers

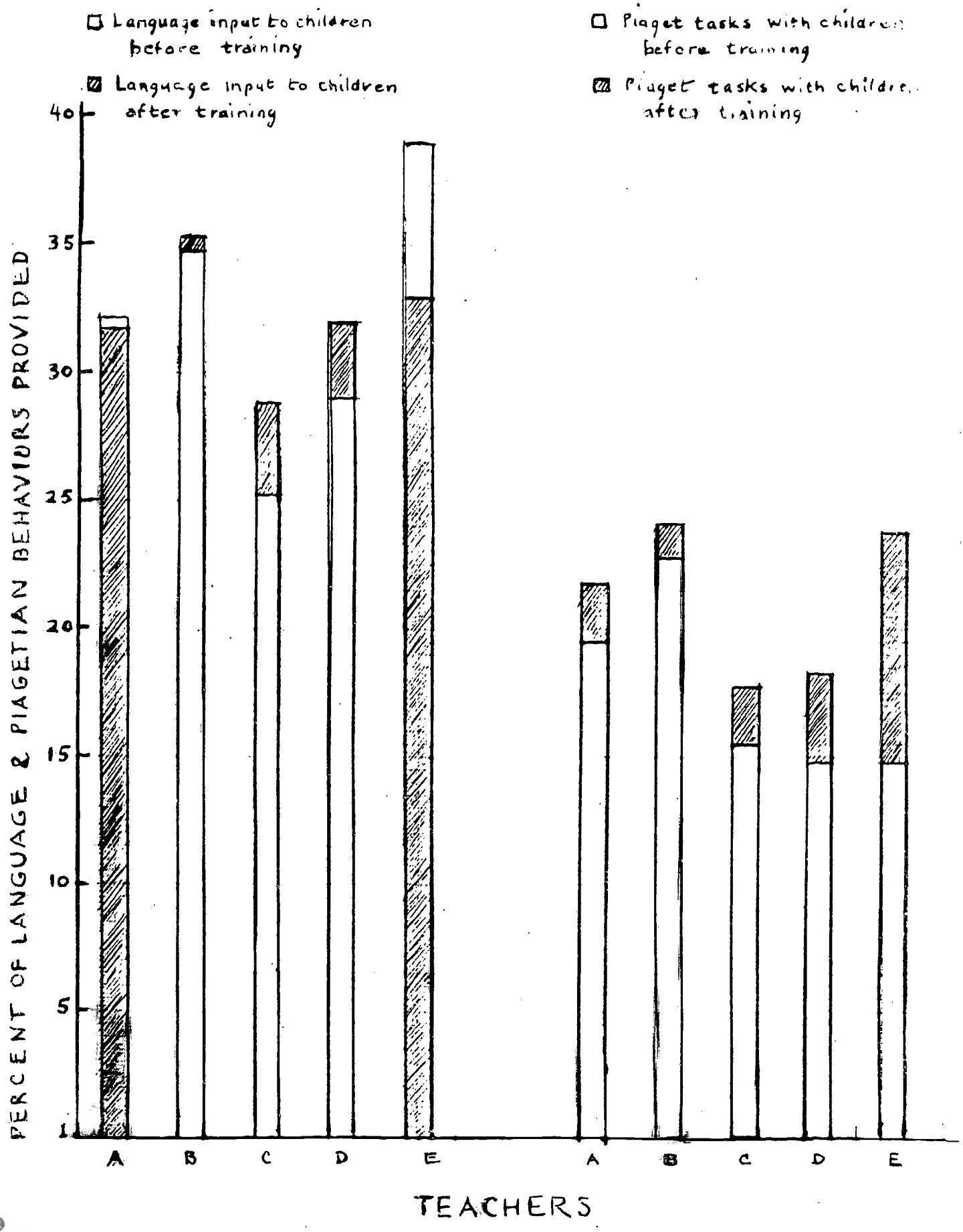
Caregiver	Language facilitation	Positive socio-emotional input	Negative socio-emotional input	Piagetian tasks	Caregiving routines: infant	Caregiving routines: environment	Motoric or kinesthetic input	Do nothing
A	32.0	27.2	1.2	20.8	5.2	5.2	8.2	0.0
B	35.1	24.6	1.0	23.5	4.6	3.5	7.6	0.0
C	26.5	26.4	2.9	16.3	11.0	11.5	5.1	0.0
D	31.1	29.8	1.9	17.1	6.6	6.3	6.9	0.2
E	36.4	26.7	.3	19.2	8.4	4.2	4.7	0.0
Total group of caregivers	31.8	26.8	1.6	19.7	6.9	6.3	6.8	0.0

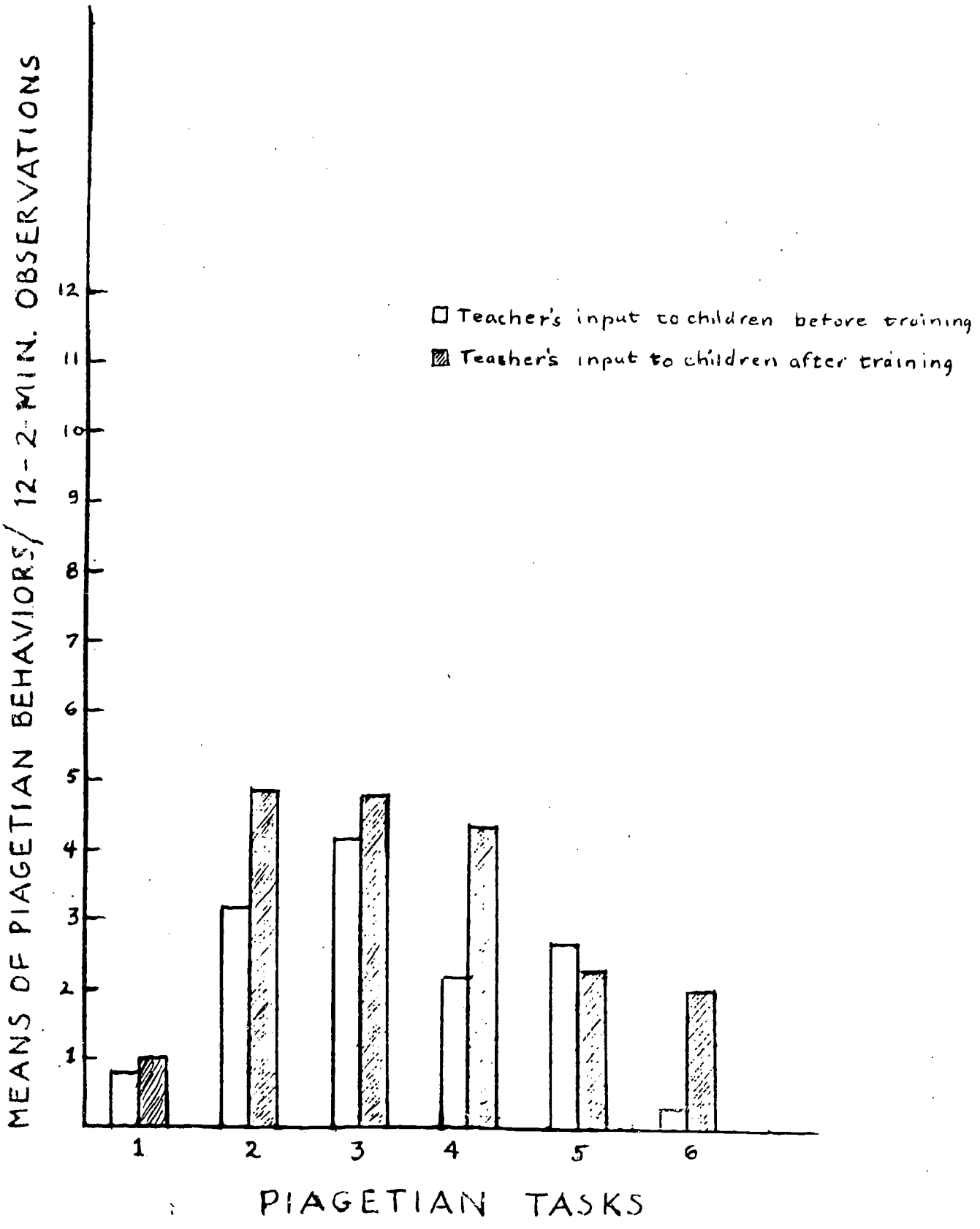
TABLE 4

Mean Frequency of Language Facilitation Items Emitted

By Teachers Out of Twelve Possible Tallies Per Half-Hour Observation

Teacher	Number of half-hour observations	Language Item								
		Elicits vocalizations	Chats	Praises	Is Solicitous	Inquires	Gives Info	Labels Sensory Experiences	Reads	Sings
A	18	3.4	7.7	4.0	3.4	1.4	3.4	.2	.05	3.1
B	18	5.4	8.4	5.0	4.3	2.3	5.4	.8	.05	1.8
C	16	3.2	6.2	2.2	1.8	2.6	1.7	.0	.4	.6
D	12	4.3	8.7	3.2	1.4	2.7	2.7	.3	.3	1.2
E	6	5.3	9.2	5.0	2.3	3.0	4.8	.5	.8	1.3


Language input to children before training
Language input to children after training
Piaget tasks with children before training
Piaget tasks with children after training
PERCENT OF LANGUAGE & PIAGETIAN BEHAVIORS PROVIDED
40
35
30
25
20
15
10
5
1
A
B
C
D
E
A
B
C
D
E
TEACHERS


MEANS OF PIAGETIAN BEHAVIORS/ 12-2 MIN. OBSERVATIONS
12
11
10
9
8
7
6
5
4
3
2
1
Teacher's input to children before training
Teacher's input to children after training
1
2
3
4
5
6
PIAGETIAN TASKS